

AMENDMENTS TO THE CLAIMS

1-21. (Canceled)

22. **(Currently Amended)** A group judgment device that is connected to a network and that shares common private information with a target device connected to the group judgment device via the network, comprising:

a conversion unit operable to ~~subject~~ convert the common private information to a predetermined conversion, to generate into first conversion information according to a predetermined conversion information;

a transmission/reception unit operable to transmit first data ~~with a predetermined format~~ to the target device, and receive, from the target device, second data including second conversion information with a predetermined format transmitted in response to the first data, the second data including second conversion information the target device converting the common private information into the second conversion information according to the same conversion as the predetermined conversion, and transmitting to the group judgment device the second data including the second conversion information that has been generated by the target device ~~subjecting the private information to the predetermined conversion~~;

a measurement unit operable to measure, as a target time, a time required between (a) transmission of the first data by the transmission/reception unit and (b) reception of the second data by the transmission/reception unit; and

a judgment unit operable to (i) compare the target time measured by the measurement unit with a reference time, the reference time being a time required ~~by data with a predetermined format to travel to and from~~ between (a) transmission of the first data to a device belonging to a predetermined group and (b) reception of the second data from the device belonging to the predetermined group, and (ii) compare the first conversion information generated by the conversion unit and the second conversion information included in the second data received by the transmission/reception unit, and judge that the target device belongs to the predetermined group in an affirmative case where when (i) a difference between the target time and the reference time is within a predetermined range and (ii) the first conversion information ~~and the~~

~~second conversion information match; matches the second conversion information and judge that the target device is external to the group in any case other than the affirmative case.~~

23. **(Currently Amended)** A group judgment device that is connected to a network and that shares common private information with a target device connected to the group judgment device via the network, comprising:

a conversion unit operable to ~~subject convert the common private information to first conversion to generate into~~ first conversion information according to a first conversion information, and ~~subject to convert the common private information to second conversion that is different from the first conversion, to generate into~~ second conversion information according to a second conversion, the first conversion being distinct from the second conversion information;

a transmission/reception unit operable to transmit first data ~~with a predetermined format~~ including the first conversion information to the target device, and receive, from the target device, second data including third conversion information ~~with a predetermined format transmitted in response to the first data, the second data including third conversion information that has been generated by the target device subjecting the private information to the second conversion the target device converting the common private information into the third conversion information according to the second conversion, and transmitting to the group judgment device the second data including the third conversion information~~;

a measurement unit operable to measure, as a target time, a time required between (a) transmission of the first data by the transmission/reception unit and (b) reception of the second data by the transmission/reception unit; and

a judgment unit operable to (i) compare the target time measured by the measurement unit with a reference time, the reference time being a time required ~~by data with a predetermined format to travel to and from~~ between (a) transmission of the first data to a device belonging to a predetermined group and (b) reception of the second data from the device belonging to the predetermined group, and (ii) compare the second conversion information generated by the conversion unit and the third conversion information included in the second data received by the

transmission/reception unit, and (iii) judge whether a message ~~indicating that fourth conversion information and the first conversion information match has been~~is received from the target device, the message indicating that the target device judges that the first conversion information matches fourth conversion information, the target device converting the common private information into the fourth conversion information according to the first conversion and comparing the first conversion information included in the received first data and the fourth conversion information, the fourth conversion information having been generated by the target device subjecting the private information to the first conversion, and (iv) judge that the target device belongs to the predetermined group in an affirmative case where when (i) a difference between the target time and the reference time is within a predetermined range, (ii) the second conversion information matches the third conversion information, and the third conversion information match, and (iii) the message ~~has been~~is received, and judge that the target device is external to the group ~~in any case other than the affirmative case.~~

24-25. (Canceled)

26. **(Currently Amended)** A group judgment system including a target device and a group judgment device that are connected to a network, the target device and the group judgment device sharing common private information ~~in advance,~~

wherein the group judgment device includes:

a first conversion unit operable to convert the common private information into first conversion information according to a predetermined conversion; and

a transmission/reception unit operable to transmit first data to the target device,

wherein the target device includes:

a reception unit operable to receive the first data ~~with a predetermined format~~ from the group judgment device;

a first second conversion unit operable to subject convert the common private information to predetermined conversion, to generate first into the second conversion information according to the predetermined conversion information, before the reception unit

~~receives the first data; and~~

~~a transmission unit operable to transmit to the group judgment device second data with a predetermined format including the first-second conversion information to the group judgment device, when the reception unit receives the first data, and~~

~~wherein the group judgment device includes:~~

~~a transmission/reception unit operable to transmit the first data to the target device, and receive from the target device the second data including the first-second conversion information;~~

~~a measurement unit operable to measure, as a target time, a time required between (a) transmission of the first data by the transmission/reception unit and (b) reception of the second data by the transmission/reception unit; and~~

~~a second conversion unit operable to subject the private information to the predetermined conversion, to generate second conversion information; and~~

~~a judgment unit operable to (i) compare the target time measured by the measurement unit with a reference time, the reference time being a time required by data with a predetermined format to travel to and from between (a) transmission of the first data to a device belonging to a predetermined group and (b) reception of the second data from the device belonging to the predetermined group, and (ii) compare the second-first conversion information generated by the second-first conversion unit and the first-second conversion information included in the second data received by the transmission/reception unit, and judge that the target device belongs to the predetermined group in an affirmative case where when (i) a difference between the target time and the reference time is within a predetermined range and (ii) the second conversion information and the first conversion information match, matches the second conversion information and judge that the target device is external to the group in any case other than the affirmative case.~~

27-30. (Canceled)

31. (New) The group judgment device according to claim 22, wherein the judgment unit is operable to judge that the target device does not belong to the predetermined group when

(i) the difference between the target time and the reference time is not within the predetermined range.

32. **(New)** The group judgment device according to claim 31, wherein the judgment unit is operable to judge that the target device does not belong to the predetermined group when (i) the difference between the target time and the reference time is within the predetermined range and (ii) the first conversion information does not match the second conversion information.

33. **(New)** The group judgment device according to claim 23, wherein the judgment unit is operable to judge that the target device does not belong to the predetermined group when the difference between the target time and the reference time is not within the predetermined range.

34. **(New)** The group judgment device according to claim 33, wherein the judgment unit is operable to judge that the target device does not belong to the predetermined group when (i) the difference between the target time and the reference time is within the predetermined range, and (ii) the second conversion information does not match the third conversion information.

35. **(New)** The group judgment device according to claim 34, wherein the judgment unit is operable to judge that the target device does not belong to the predetermined group when (i) the difference between the target time and the reference time is within the predetermined range, (ii) the second conversion information matches the third conversion information, and (iii) the message is not received.

36. **(New)** The group judgment system according to claim 26, wherein the judgment unit is operable to judge that the target device does not belong to the predetermined group when (i) the difference between the target time and the reference time is not within the predetermined

range.

37. **(New)** The group judgment system according to claim 36, wherein the judgment unit is operable to judge that the target device does not belong to the predetermined group when (i) the difference between the target time and the reference time is within the predetermined range and (ii) the first conversion information does not match the second conversion information.

38. **(New)** A method for controlling a group judgment device, the group judgment device being connected to a network and sharing common private information with a target device connected to the group judgment device via the network, the method comprising:

converting the common private information into first conversion information according to a predetermined conversion;

transmitting first data to the target device, and receive, from the target device, second data including second conversion information in response to the first data, the target device converting the common private information into the second conversion information according to the same conversion as the predetermined conversion, and transmitting to the group judgment device the second data including the second conversion information;

measuring, as a target time, a time required between (a) transmission of the first data by the transmission/reception unit and (b) reception of the second data by the transmission/reception unit;

comparing the target time measured by the measurement unit with a reference time, the reference time being a time required between (a) transmission of the first data to a device belonging to a predetermined group and (b) reception of the second data from the device belonging to the predetermined group;

comparing the generated first conversion information and the second conversion information included in the received second data; and

judging that the target device belongs to the predetermined group when (i) a difference between the target time and the reference time is within a predetermined range and (ii) the first

conversion information matches the second conversion information.